UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA,	
-v-	06 Cr. 580 (JSR)
CHAZ GLYNN,	OPINION AND ORDER
Defendant.	

JED S. RAKOFF, U.S.D.J.

Defendant Chaz Glynn is charged with murder in aid of racketeering in violation of 18 U.S.C. § 1959(a)(1)-(2), murder in connection with drug trafficking in violation of 18 U.S.C. § 848(e)(1)(A) and murder through use of a firearm, in violation of 18 U.S.C. § 924(j). The charges were initially tried before a jury in June, but, after the jury announced that it was hopelessly deadlocked, the Court, at defendant's request, granted a mistrial and set the case down for a retrial, which will commence September 29, 2008. Barring unexpected developments, the Court expects to adhere at the retrial to the evidentiary rulings it made at the first trial, with one minor change set forth below. Accordingly, to guide counsel in preparing for the retrial, this Opinion and Order will set forth the reasons for the limitation the Court placed on the testimony of the Government's ballistics expert at the first trial and will reaffirm that that limitation, with one minor alteration, will govern such testimony at the retrial.

At the first trial, the Government sought to introduce expert testimony from Detective James Valenti, a New York City Police

Department firearms analyst, to the effect that it was his opinion, "to a reasonable degree of ballistic certainty," that a bullet recovered from the victim's body and shell casings recovered from two related crime scenes came from firearms linked to Glynn. See transcript of the first trial ("tr.") 6/30/08, at 907-08, 991. Glynn moved to exclude the testimony primarily on the ground that the field of ballistics is not based on sufficiently reliable methods to satisfy the threshold requirements for admissibility under Rule 702 of the Federal Rules of Evidence. See Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993); Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999); see also Memorandum in Support of Defendant Glynn's Motion to Preclude Certain Government Proposed Expert Testimony at 13-22.

Building on a ruling it had made two weeks earlier in another trial involving ballistics testimony, United States v. Damian Brown et al., 05 Cr. 538, the Court, following a "Daubert" hearing, ruled from the bench that Valenti could not testify that ballistics was a "science," nor could he claim that he reached his conclusions to any degree of "certainty," whether "ballistic certainty" or otherwise, see tr. 6/30/08 at 907.[1] The Court further ruled, however, that Valenti's methodology was sufficiently reliable that he could give an opinion that it was at least "more likely than not" that the bullet and casings came from the guns in question. See id. at 1000. This

[1] For the similar rulings in the Brown trial, in which all four defendants were convicted of all charges, see, for example, the transcript of the Brown trial at 1398-99 (6/16/08).

ruling was the product not only of the Daubert hearing held in Glynn but also the Daubert hearing held in Brown, which, by agreement of the parties in Glynn, was incorporated by reference in Glynn along with additional testimony and other evidence added in Glynn, most notably the testimony of Valenti himself.[2]

By way of general background, for many decades ballistics testimony was accepted almost without question in most federal courts in the United States. See, e.g., United States v. Hicks, 389 F.3d 514, 526 (5th Cir. 2004) (stating that "the matching of spent shell casings to the weapon that fired them has been a recognized method of ballistics testing in this circuit for decades" and citing examples); United States v. Montiero, 407 F. Supp. 2d 351 (D. Mass. 2006)

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[2] The new evidence also included, inter alia, responses to evidence adduced at the Daubert hearing in Brown. For example, one of the defendants in the Brown trial, defendant Dwayne Palmer (represented by the same counsel who represented Glynn in the instant case) had submitted as part of the Daubert hearing there an affidavit from Professor Adina Schwartz of the John Jay College of Criminal Justice of the Graduate Center, City University of New York, which was critical of ballistics testing in many respects. During the Daubert hearing in the Glynn trial, the Government introduced a recently-published critique of Schwartz's argument by a noted firearms examiner, Ronald Nichols. See Ronald Nichols, The Scientific Foundations of Firearms and Tool Mark Identification – A Response to Recent Challenges. The Court likewise accepted for consideration Schwartz's published reply to that critique, see Adina Schwartz, Commentary on Nichols RG Defending the Scientific Foundations of the Firearms and Tool Mark Identification Discipline; Responding to Recent Challenges, 52 J. Forensic Sci. 1414-15 (Nov. 2007). By contrast, the Government in Glynn also sought to introduce an affidavit from Stephen G. Bunch, a Supervisory Physical Scientist at the Federal Bureau of Investigation ("FBI"). However, as Bunch, a Government agent, declined (as he had in Brown) to make himself available for live testimony at the Daubert hearing, and consequently was not subject to cross-examination, the Court refused to admit Bunch's affidavit. See tr. 6/27/08.

(describing admission of firearm identification testimony in prior years as "semi-automatic"); United States v. Foster, 300 F. Supp. 2d 375, 377 n.1 (D. Md. 2004) ("Ballistics evidence has been accepted in criminal cases for many years."). But, like many other forms of expert testimony, this practice was subjected to new scrutiny in light of Daubert and Kumho Tire and the subsequent amendment to Federal Rule of Evidence 702,[3] which gave to the courts a more significant gatekeeper role with respect to the admissibility of scientific and technical evidence than courts previously had played. See, e.g., Advisory Committee Note to 2000 Amendments to Fed. R. Evid. 702 (explaining that the amendment "affirms the trial court's role as gatekeeper" that developed in response to Daubert and Kumho Tire, which "charged trial judges with the responsibility of acting as gatekeepers to exclude unreliable expert testimony").

The Supreme Court made clear in Daubert that no purportedly scientific expert testimony could be admitted unless it met certain rigorous requirements. See Daubert, 409 U.S. at 593-94 (directing courts to examine: (1) whether the expert's theory or technique "can

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[3] In 2000 the Rule was amended to read:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

be (and has been) tested"; (2) "whether the theory or technique has been subjected to peer review and publication"; (3) "the known or potential rate of error" in the theory's application and "the existence and maintenance of standards controlling the technique's operation"; and (4) the "general acceptance" of the theory or technique in the relevant scientific community). In Kumho Tire, however, the Court also made clear that while the basic requirements of reliability – as they are now articulated in Rule 702 – apply across the board to all expert testimony, the more particular standards for scientific evidence need not be met when the testimony offered does not purport to be "science." See Kumho Tire, 526 U.S. at 151-52. This distinction was well-illustrated in Judge Louis Pollak's well-known decisions regarding fingerprinting evidence, in which he held in an initial opinion that fingerprinting did not rest on sufficiently "scientific" principles to be admitted under Daubert but subsequently held that the technique afforded sufficient practical reliability to be admissible, subject to the court's oversight, as expert testimony. See United States v. Plaza, 179 F. Supp. 2d 492, 516-18 (E.D. Pa. 2002); United States v. Plaza, 188 F. Supp. 2d 549, 576 (E.D. Pa. 2002) (granting motion for reconsideration).

More recently, three federal judges have addressed the scientific status vel non of ballistics identification testimony, and all three have concluded that, in one respect or another, it does not have sufficient rigor to be received as science. See United States

v. Monteiro, 407 F. Supp. 2d 351, 355 (D. Mass. 2006) (Saris, J.) (finding that while the underlying principles behind firearm identification may be scientifically valid, "there is no reliable . . . scientific methodology which will currently permit the expert to testify that [a casing and a particular firearm are] a 'match' to an absolute certainty, or to an arbitrary degree of statistical certainty."); United States v. Green, 405 F. Supp. 2d 104, 120-22 (D. Mass. 2005) (Gertner, J.) (discussing ways in which ballistics evidence fails to meet Daubert criteria regarding, inter alia, testability, reliability, and error rates); United States v. Diaz, No. 05-167, 2007 U.S. Dist. LEXIS 13152, at *35-36 (N.D. Cal. Feb. 12, 2007) (Alsup, J.) (citing Monteiro's conclusion that no scientific methodology exists to support a finding of a match to an absolute certainty, but permitting testimony "to a reasonable degree of ballistic certainty"). All three, however, ruled that the expert testimony was sufficiently reliable to warrant admission in some qualified form. See Monteiro, 407 F. Supp. 2d at 372; Green, 405 F. Supp. 2d at 124; Diaz, 2007 U.S. Dist. LEXIS 13152, at *41-42.

Based on the Daubert hearings this Court conducted in Brown and Glynn, the Court very quickly concluded that whatever else ballistics identification analysis could be called, it could not fairly be called "science."[4] For example, Valenti, when asked to

[4] Although ballistics examiners continue to assert, as do their manuals and literature, that "scientific principles" underlie the field, neither of the Government's witnesses in Glynn and Brown was able to identify those principles. See, e.g., tr. 6/30/08, at 880. The Court suspects that they consist

define what constitutes "sufficient agreement" between two pieces of ballistic evidence to declare a match, admitted that the assessment is subjective, in that "it is an opinion of mine and whether or not someone else would agree with it is up to that individual." See Tr. 6/30/08 at 880.[5] In light of this admission, the Government did not seriously contest the Court's conclusions that ballistics lacked the rigor of science and that, whatever else it might be, its methodology was too subjective to permit opinions to be stated to "a reasonable degree of ballistic certainty."

Those conclusions did not end the inquiry, however. The Court then had to determine whether firearm identification, though somewhat subjective, was nonetheless sufficiently reliable to qualify for admissibility under Kumho Tire, and if so, with what degree of confidence a ballistics expert could express his opinions. This latter issue is particularly important because, once expert testimony is admitted into evidence, juries are required to evaluate the expert's testimony and decide what weight to accord it, but are necessarily handicapped in doing so by their own lack of expertise.

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of no more than those elementary principles of physics that govern the transfer of impressions to a bullet and casing when a gun is fired.

[5] In addition, Valenti had repeated a prior analysis of the evidence by another examiner, and – contrary to the basic scientific principle of "blind" studies – viewed the prior analyst's comparison and conclusion before conducting his own. See tr. 6/30/08 at 885; see generally D. Michael Risinger et al., The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion, 90 Calif. L. Rev. 1 (Jan. 2002) (discussing "observer effects" on reliability of forensic examination).

There is therefore is a special need in such circumstances for the Court, if it admits such testimony at all, to limit the degree of confidence which the expert is reasonably permitted to espouse.[6]

When, following the Daubert hearing in Brown and, subsequently, in Glynn, the Court confronted the first of these two questions, viz., whether the ballistics testimony should be admitted at all under Kumho Tire, the Court began by considering the field's basic theory of identification. The most succinct statement of this theory presented to the Court was the one appearing in the New York City Policy Department's Police Laboratory Firearms Analysis Section Procedures Manual (the "Manual"), which states:

> 1. The theory of identification as it pertains to the comparison of toolmarks enables opinions of common origin to be made when the unique surface contours of two toolmarks are in "sufficient agreement."
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> 2. The "sufficient agreement" is related to the significant duplication of random toolmarks as evidenced by the correspondence of a pattern or combination of patterns or surface contours. Significance is determined by the comparative examination of two or more sets of surface contour patterns comprised of individual peaks, ridges and furrows. Specifically, the relative height or depth, width, curvature and spatial relationship of the individual peaks, ridges and furrows

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[6] Indeed, this Court confronted a very similar issue, albeit in the civil rather than criminal context, in In re Ephedra, a multidistrict litigation that turned, in part, on whether ephedra, a substance contained in diet supplements, caused certain medical problems. See In re Ephedra Prods. Liab. Litig., 393 F. Supp. 2d 181, 184 (S.D.N.Y. 2005). There, the Court ruled that plaintiffs' experts "shall not be permitted to testify with 'medical certainty' or 'scientific certainty' that ephedra caused the alleged injuries," but could instead testify "that ephedra may be a contributing cause of stroke, cardiac injury, and seizure in some people." See id. at 184 (citing Court's earlier ruling).

> within one set of surface contours are defined and compared to the corresponding features in the second set of surface contours. Agreement is significant when it exceeds the best agreement demonstrated between toolmarks known to have been produced by the same tool. The statement that "sufficient agreement" exists between two toolmarks means that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.
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> 3. Currently the interpretation of individualization/ identification is subjective in nature, founded on scientific principles and based on the examiner's training and experience.

Id., FAS 14, at 3.[7] As this statement indicates, as Valenti admitted during the Daubert hearing in Glynn, see tr. 6/30/08 at 879-80, and as the literature confirms,[8] ballistics opinions are significantly subjective. Moreover, the standard defining when an examiner should declare a match – namely, "sufficient agreement" – is inherently vague.

On the other hand, while this subjectivity and vagueness might suggest that ballistics identification involves little more than a hunch, such a characterization would be unfair. Firearm and

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[7] The language derives from the "Theory of Identification" proposed by the Association of Firearm and Tool Mark Examiners," reprinted in Daniel L. Cork et al., Ballistics Imaging 59 (Nat'l Research Council & Nat'l Acad. of Sci. 2008) ("NRC Report").

[8] See, e.g., NRC Report at 55 ("Ultimately, as firearms identification is currently practiced, an examiner's assessment of the quality and quantity of resulting toolmarks and the decision of what does or does not constitute a match comes down to a subjective determination based on intuition and experience."); A. A. Bisotti, The Principles of Evidence Evaluation as Applied to Firearms and Tool Mark Identification, 9 J. of Forensic Sci. 428, at 429 (1964) ("[T]he subject of firearms and tool mark identification will remain essentially an art limited by the intuitive ability of individual practitioners.").

toolmark analysis rests on the twin assumptions that the surface contours of every gun are unique and that, every time that gun is fired, some of those unique markings, along with markings caused by the act of firing itself, are transferred to the shell casing and bullet, leaving distinctive patterns on each of them. See, e.g., Daniel L. Cork et al., Ballistics Imaging 30-46 (Nat'l Research Council & Nat'l Acad. of Sci. 2008) ("NRC Report"); tr. 6/30/08 at 882-83 (describing some studies). While these assumptions have never been definitively tested, nonetheless, in an earlier era when firearms were to some extent "hand-made," the assumption of their distinctiveness was perhaps self-evident. Now, however, when guns are mass-produced with ever greater precision, they have become ever more regular. See NRC Report at 46-49 (discussing gun manufacture). As a result, one can expect certain markings to be left on every bullet and casing fired from every gun of a particular make. Firearms analysts call these shared markings "class characteristics," because they appear on all firearms of a certain type produced by the same manufacturer. See id. at 56-61; tr. 6/30/08 at 873.

Yet, it is asserted, the basic assumptions of ballistics identification still hold because, even in an era of mass production of firearms, the gun manufacturing process never operates identically in any given case, and therefore causes differences between any two guns that, while tiny, may still be detected by use of such techniques as the comparison microscope. See NRC Report at 56-61. While this assertion has not been put to the rigorous testing that

science demands, it has been sufficiently well-documented as to support a reasonable hypothesis of its validity. See tr. 6/30/08 at 882-83.[9] The same is true of the assumption that these unique characteristics of each firearm are to an appreciable degree copied onto some or all bullets and casings fired from that gun. While never proven to a degree of scientific certainty, this assertion is both plausible and sufficiently documented by experience as to provide a good working assumption for most practical purposes. See NRC Report at 42-46. (It should be noted, however, that in addition to a firearm's class characteristics and individual characteristics, a firearm may also have "subclass characteristics" that arise when an imperfection in a particular manufacturing tool causes a batch of firearms produced at the same time and place to have certain common characteristics until the imperfection is eliminated or the tool replaced. See id. at 56-61.)[10]

Based on these assumptions, the primary task of a forensic firearms examiner is to compare the individual markings that are

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[9] See, e.g., Stephen G. Bunch & Douglas P. Murphy, A Comprehensive Validity Study for the Forensic Examination of Cartridge Cases, 35 AFTE Journal 201 (2003); Yoshimitsu Ogihara et al., Comparison of 5000 Consecutively Fired and Cartridge Cases from a 45 Caliber M1911A1 Pistol, 15 AFTE Journal 127 (1983); Erich D. Smith et al., Cartridge Case and Bullet Comparison Validation Study with Firearms Submitted in Casework, 36 AFTE Journal 130 (2004).

[10] For further discussion of the principles discussed in the above paragraph, the reader is referred to Judge Saris's "Primer on Firearm Identification," Monteiro, 407 F. Supp. 2d at 359-62, Judge Gertner's detailed explanation in Green, 405 F. Supp. 2d at 110-11, and Judge Alsup's discussion in Diaz, 2007 U.S. Dist. LEXIS 13152, at *4-10.

neither class nor subclass characteristics found on a bullet or shell casing recovered from a crime scene to the corresponding kind of markings found on a bullet or shell casing produced from test-firing a particular firearm, and analyze the degree of agreement between these individual markings. See NRC Report at 64-67; tr. 6/30/08 at 875-76. The primary difficulty inherent in this analysis, however, is that real-life conditions rarely allow for a perfect comparison. The bullets and/or shell casings recovered from the crime scene may be damaged, fragmented, crushed, or otherwise distorted in ways that create new markings or distort existing ones. A gun barrel may itself change slightly with each firing, such that it may leave different impressions on a casing depending on when during the gun's life a shot is fired. See, e.g., Green, 405 F. Supp. 2d at 111. Casings from the same firearm may appear markedly different because of an irregular firing or because of the manner in which they hit against various materials. Furthermore, the instruments used to compare the samples have their own distorting effects.[11] Without multiplying examples, it is commonplace that ballistics comparisons involve the exercise of a considerable degree of subjective judgment.

This, of course, is true of many other kinds of accepted expertise; a physician's diagnosis, for example, often involves the

[11] For example, the "comparison microscopes" an examiner uses to make a visual inspection of two pieces of evidence, have certain limitations: most notably, they produce flat images despite the fact that a bullet or casing is round, thereby producing distortions not unlike those on a map showing the globe.

exercise of subjective judgment, based in part on experience. A notable difference, however, is that ballistics comparison lacks defining standards to a degree that exceeds most other kinds of forensic expertise. For example, whereas both a ballistics examiner and a fingerprint examiner are ultimately called upon to make a subjective judgment of whether the agreement between two pieces of evidence is "sufficient" to constitute a "match," a fingerprint examiner may not declare a match unless a pre-specified number of "points" of similarity exist between the two samples, see, e.g., United States v. Mitchell, 145 F.3d 572, 575 (3d Cir. 1998); Plaza, 188 F. Supp. 2d at 564. Although attempts been made to introduce similar minimum standards and "protocols" into ballistics analysis,[12] such attempts have not yet met with general acceptance and, in any event, were not applied by the examiners in Brown and Glynn.

It follows that ballistics examination not only lacks the rigor of science but suffers from greater uncertainty than many other kinds of forensic evidence. Yet its methodology has garnered sufficient empirical support as to warrant its admissibility. See, e.g., NRC Report at 70-75, 81-85; tr. 6/30/08 at 882-83. The problem is how to admit it into evidence without giving the jury the impression – always a risk where forensic evidence is concerned –

[12] In particular, ballistics theorists have recently developed a process called consecutive matching striae ("CMS"), in which an analyst may conclude that two bullets match if they share one six-line "run" of striae (i.e., a group of closely aligned striae) or two three-line runs of striae. See Diaz, 2007 U.S. Dist. LEXIS 13152, at *10-11.

that it has greater reliability than its imperfect methodology permits. The problem is compounded by the tendency of ballistics experts – such as those in Brown and Glynn – to make assertions that their matches are certain beyond all doubt, that the error rate of their methodology is "zero," and other such pretensions. Although effective cross-examination may mitigate some of these dangers, the explicit premise of Daubert and Kumho Tire is that, when it comes to expert testimony, cross-examination is inherently handicapped by the jury's own lack of background knowledge, so that the Court must play a greater role, not only in excluding unreliable testimony, but also in alerting the jury to the limitations of what is presented.[13] The Court therefore concluded that to allow Detective Valenti, or any other ballistics examiner, to testify that he had matched a bullet or casing to a particular gun "to a reasonable degree of ballistic certainty" would seriously mislead the jury as to the nature of the expertise involved.

To be admissible as relevant evidence under the Federal Rules of Evidence, however, evidence (expert or otherwise) need not meet any such exalted level of certainty. It is simply sufficient that

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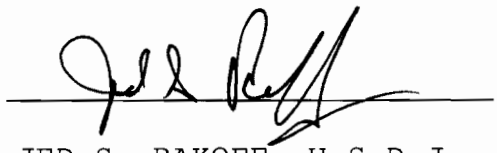
[13] In Brown, the Government's expert, Detective Luis Fontanez, initially proposed to effectively deprive the jury of any role whatever by testifying to his conclusions without presenting to the jury any photographs of the microscopic comparisons he performed in the course of his analysis, thereby preventing the jury from making the comparisons for itself. Had the Government persisted in this position, the Court would not have admitted the testimony at all; however, the Government subsequently agreed to present such photographs, and in Glynn, they agreed from the outset to present such photographs to the jury.

the proffered evidence can "make the existence of any fact that is of consequence to the determination of th action more probable or less probable than it would be without the evidence." Fed. R. Civ. P. 401. The Court therefore determined, first in Brown and then in the initial trial of Glynn, that the ballistics examiners in those cases would be permitted to testify only that a firearms match was "more likely than not," thereby satisfying Rule 401 without overstating the capacity of the methodology to ascertain matches.[14] This limitation will continue to apply to any ballistics testimony offered by the Government in the retrial of this case.

In Glynn, the Court was also persuaded to permit Valenti to add the qualifier "at least," so that his opinion was that the matches were "at least more likely than not." On further reflection, however, this qualifier serves only to add uncertainty to what is otherwise clear-cut: that the opinion has utilized a methodology that permits him to determine, albeit with some subjectivity, that certain markings more likely than not emanated from the same gun. To add the qualifier "at least" is to inject an element of vagueness into this otherwise straightforward conclusion. Accordingly, the ballistics opinions offered at the Glynn retrial may be stated in terms of "more likely than not," but nothing more.

[14] Because the burden of proof in a criminal case is "beyond a reasonable doubt," it follows that a conviction in a criminal case may not rest exclusively on ballistics testimony.

SO ORDERED.



JED S. RAKOFF, U.S.D.J.

Dated: New York, New York
September 22, 2008